June 26, 1962 P. J. SPERZEL 3,040,339

PRE-SET SUSTAINING HINGE FOR TOILET SEATS

Filed March 7, 1960

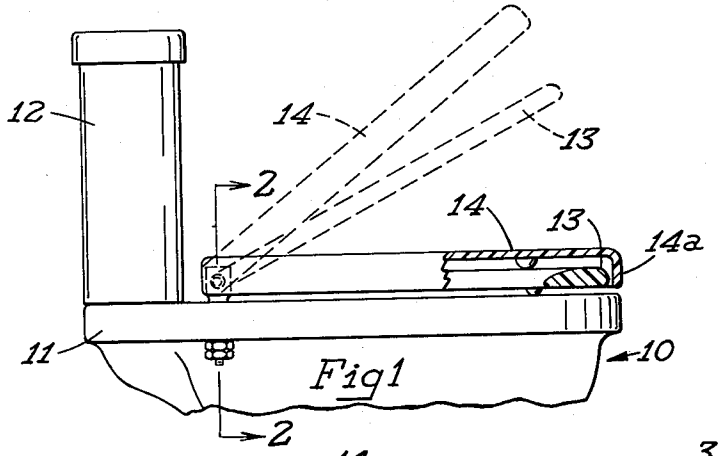


Fig 1

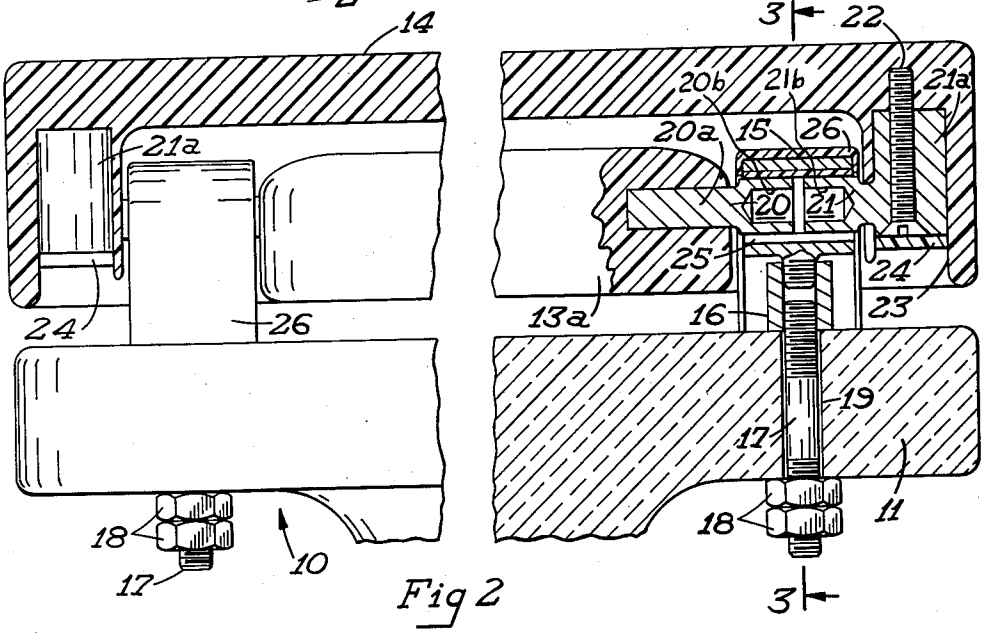


Fig 2

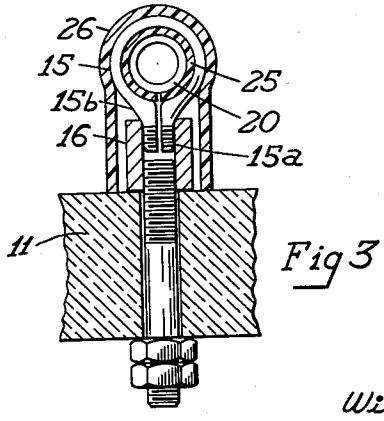


Fig 3

INVENTOR.
PETER J. SPERZEL

BY

Williamson, Schroeder, & Palmatier
ATTORNEYS

United States Patent Office 3,040,339 Patented June 26, 1962

3,040,339

PRE-SET SUSTAINING HINGE FOR TOILET SEATS

Peter J. Sperzel, 205 Live Oak Lane, Los Altos, Calif.

Filed Mar. 7, 1960, Ser. No. 12,996
2 Claims. (Cl. 4—240)

This invention relates generally to sustaining toilet seat hinges and more particularly to a pre-set sustaining hinge which is tensioned at the time of manufacture rather than when installed.

This present invention is an improvement over the structure disclosed and claimed in my prior United States Patent Number 2,901,753, issued September 1, 1959, and entitled Pre-Set Sustaining Hinge for Toilet Seats. Prior to the development of the pre-set sustaining hinge set forth in said aforementioned patent, no satisfactory sustaining hinges for toilet seats had been developed which were capable of being accurately tensioned at the time of manufacture, the prior art devices requiring tensioning to produce the required frictional resistance between the various cooperating hinge elements at the time of installation. These prior art devices proved unsatisfactory due in large part to the reluctance of the plumbers or installers of such toilet seats to adequately tighten the hinge elements to produce the desired frictional resistance, the degree of which is quite critical in order that the seats may function properly.

The pre-set sustaining hinge set forth in my aforementioned patent solved the aforementioned problems of the prior art devices by providing a novel, simple sustaining hinge which can be pre-set at the factory by the manufacturer thereof to thereby simplify the installation of toilet seat assemblies and avoid the problem of improper installation on the part of the plumber. The pre-set sustaining hinge of my prior patent has proved successful and has definitely solved the problem of accurately tensioning the members to obtain the required frictional resistance by enabling the manufacturer to accomplish this tensioning at the time of making and prior to shipping thereof for subsequent installation. However, each of my aforementioned pre-set hinge assemblies are adapted for use with only a single movable member at a time, being applicable to either the seat or the cover, and thereby posing a problem where a seat and cover combination are desired.

Also, in those instances in the past in which covers have been used in combination with one another and provided with frictionally tensioned sustaining hinges, it has been necessary to provide different non-interchangeable hinge assemblies sometimes referred to as "right" side and "left" side hinge assemblies, to be used on opposite sides of the toilet seat and cover, the hinge assemblies being adapted to sustain the cover, the other hinge assembly being adapted to sustain the seat. This arrangement increases costs by requiring the manufacture of two different kinds of hinge assemblies and the component parts thereof, requires separate storage, shipping and identification and is inconvenient to the installer who must make certain that he has each kind of hinge assembly available at the time of installation. Another important disadvantage of these prior art devices is that the pair of different hinge assemblies used provide only a single sustaining unit for each of the cover and seat, since each of the hinge assemblies are designed to sustain only one or the other of said seat and cover.

In addition, the pre-set sustaining hinge of my prior patent utilizes a metal to metal contact between the cooperating hinge elements thereof to obtain the desired tension and frictional resistance, which metal to metal contact results in a somewhat stiff squeaky operation and also increases the wear thereof thereby reducing the life of the hinge.

Therefore, an important object of the present invention is to provide a sustaining hinge which can be pre-set at the factory by the manufacturer thereof and which overcomes the difficulties previously encountered with my prior device by providing a sustaining hinge assembly which may be used simultaneously to support both the seat and the cover.

Still another object is a pre-set sustaining hinge of the class described which is capable of supporting both the cover and seat simultaneously and which further permits simultaneous tensioning to the desired frictional resistance of both the seat and cover to the same degree of tension.

Still another object is a novel sustaining hinge of the class described which may be used interchangeably on both sides of the toilet seat assembly, thereby lessening by half the number of assembly parts required.

Still another object is a novel sustaining hinge assembly of the class described which is adapted to simultaneously support both the seat and the cover under pre-set frictional tension and which is adapted for use in pairs interchangeably on both sides of the toilet seat assembly to double the sustaining power on both the seat and cover over sustaining hinge assemblies for seats and covers presently available.

Still another object is an improved pre-set sustaining hinge for toilet seats and covers employing self-lubricating anti-friction means between the cooperating metal parts of the hinge elements to provide smooth, substantially noiseless operation and materially add to the life thereof.

A further object is a sustaining hinge of the class described which may be selectively employed to sustain either the seat, the cover, or both as desired.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a side elevational view of a toilet seat assembly embodying one form of my invention and showing the cover and seat in partially raised frictionally held position by dotted lines and in lowered position by full lines with a portion thereof broken away;

FIG. 2 is an enlarged vertical section of the form of my invention illustrated in FIG. 1 taken on the line 2—2 of FIG. 1 with portions thereof shown in elevation; and

FIG. 3 is a vertical section taken on the line 3—3 of FIG. 2.

Reference is now made to the accompanying drawings for a more detailed description of my invention. FIG. 1 illustrates a conventional toilet bowl **10** having a rear flange **11** and a flush tank **12** connected therewith. The flange **11** has a pair of openings therethrough which are provided for attachment of a toilet seat unit thereto. A toilet seat **13** having a rearwardly extending tongue element **13***a* is provided, as well as a cover member **14** for overlying said toilet seat, the cover **14** having a depending lip **14***a* extending downwardly from the marginal edge thereof for enclosing the seat when the two are in completely lowered position.

In the toilet seat unit illustrated, a pair of identical hinge assemblies of my invention are provided for supporting the seat and cover and securing the same to the toilet bowl. Each hinge assembly of my invention consists of a split externally tapered eye bolt **15** which is split longitudinally downwardly through the shank thereof, the split portions **15***a* of said shank being externally threaded to receive an internally threaded clamping element or collar **16** which forms a supporting member having an internally tapered clamping socket formed in the upper portion thereof to receive the externally tapered

portion 15*b* of the eye 15. The clamping collar 16 rests upon the top surface of the flange 11 of the toilet bowl, the clamping collar and split eye member 15 being securely anchored thereto by the anchoring bolt 17 extending through the opening 19 provided in the flange 11 and nut 18, the upper end of the anchoring bolt 17 being externally threaded and threadedly engaged with the threaded bore of the clamping collar 16.

The enlarged head or sleeve portion of the eye bolt 15 has a generally circular bore which enables the head to function as a female hinge element for cooperatively receiving the substantially identical cylindrical annular male hinge elements 20 and 21 which have the same cross-sectional shape and size. The hinge element 20 extends laterally outwardly from the tongue 13*a* of the seat and has a knurled shank portion 20*a* affixed to and preferably embedded in the tongue of the seat as by molding if the seat is made of plastic. The hinge element 21 is provided with an enlarged head portion 21*a* having a suitable opening therein for receiving an anchoring screw 22 for securing the hinge element 21 to the cover 14, the head portion 21*a* being seated and concealed in a suitable recess 23 provided in said cover, and covered by a removable non-metallic preferably plastic protective shield 24 inserted into the recess 23 and frictionally retained therein. It will also be noted that hinge element 20 has a hollow bore 20*b* and that the hinge element 21 has a hollow bore 21*b*.

A suitable annular non-metallic long wearing lining or bushing 25 is provided intermediate or between the bore of the eye bolt and the hinge elements 20 and 21 disposed therewithin to prevent metal to metal contact between said eye bolt head and the hinge elements 20 and 21. This bushing is preferably of plastic and more particularly of nylon which acts or functions as a life long lubricant and provides for smooth moving action between the male and female hinge elements and provides for a substantially noiseless squeakless hinging movement therebetween and provides considerable gripping or friction with the surfaces against which is pressed and engaged thereby to provide the frictional tension or resistance necessary to sustain the seat and cover. The exposed portion of the hinge assembly disposed between the seat and cover is enclosed by a non-metallic preferably plastic protective cover shield 26 and is provided with pin receiving openings in the sides thereof to permit the hinge elements 20 and 21 to extend therethrough, the cover shield being adapted to prevent corrosion of the metal parts.

In use and operation, the male hinge elements 20 and 21 are simply inserted into the eyebolt 15 and the clamping collar 16 is tightened on the shank thereof until the desired frictional resistance is produced which will permit either or both the cover and seat to be retained in any desired raised position. It will be appreciated that the frictional resistance to swinging of the cover and seat may be accurately pre-set at the time of manufacture and need not be adjusted when the seat unit including both the cover and seat is installed on the toilet bowl, and that the degree of frictional resistance is entirely independent of the tension in the hold-down or anchoring bolts 17 which need only be tightened sufficiently to securely anchor the clamping collar 16 firmly against the toilet bowl flange, thereby simplifying the installation thereof and avoiding the necessity of relying on the installers to properly preset the frictional resistance between the hinge elements. In addition, it is apparent that the sustaining frictional resistance may be readily readjusted at any time by simply tightening or loosening the collar 16.

In some instances, it may be desirable or necessary to insert one or the other of the hinge elements 20 and 21 into the sleeve provided by the eye bolt and bushing after the other of the hinge elements is already located therewithin. In such instance, the bore of the male hinge element being inserted provides an expansion chamber for the air within the bore of the eye bolt and prevents a cushion of air from building up ahead of the male element being inserted which would otherwise make difficult the complete insertion of the male hinge element. This is of particular importance where it is desirable not to disturb the pre-setting of the collar with respect to the eye bolt, and makes it possible to preset the hinge to the desired frictional resistance with only one of the male hinge elements being in cooperative engagement with the eye bolt.

From the foregoing, the advantages of my invention are readily apparent. The hinge assembly of my invention including the female hinge element 15, the male hinge elements 20 and 21 and the clamping collar 16 enable both the seat and cover to be supported by and secured to the toilet bowl by means of a single hinge assembly with both the seat and cover being provided with sustaining frictional resistance of the same magnitude which may be provided simultaneously to materially simplify the mounting and sustaining of both the seat and cover and to simplify the assembling and pre-setting thereof at the factory or at the time of installation if desired, since the frictional resistance for both the seat and the cover are provided simultaneously by the single adjustment of the clamping collar. In addition, the hinge assembly of my invention may be used in pairs as shown on both "right" and "left" hand sides of the seat and cover assembly with the parts thereof completely interchangeable, thereby reducing by half the number of assembly parts normally required in prior art devices in which separate right and left hand assemblies of different construction have been necessary. In addition, this particular hinge assembly when used in pairs doubles the sustaining power on both the seat and cover over those hinge assemblies of the prior art devices, since each of the hinge assemblies of my invention herein disclosed provides for a sustaining frictional resistance for both the seat and cover, whereas in the prior art devices the hinge assembly on one side was adapted for sustaining only one of the units of the toilet seat assembly, that is either the cover or seat and the hinge assembly on the other side was adapted to provide sustaining frictional resistance to the other of said toilet seat units.

Attention is also called to the importance of the nylon bushing 25 provided between the male and female hinge elements to prevent direct metal to metal contact therebetween and provide for smooth noiseless operation thereof and to materially increase the life of the hinge assembly by substantially reducing the wear thereon, which is a material factor in the commercial acceptance and desirability of a toilet seat unit of this nature.

The hinge assembly disclosed herein also has the advantage that it may be used not only to sustainingly support both a seat and cover simultaneously, but also may be used to sustainingly support either the seat or cover alone, thereby further reducing the number of hinge assembly parts, since the instant hinge assembly is adaptable to all situations requiring a sustaining type hinge. Also, the socketed construction of the male hinge elements and the presence of the nylon bushing make it possible to readily withdraw and re-insert either of the male hinge elements in the sleeve of the eye bolt, after the desired frictional resistance has been obtained by adjustment of the clamping collar, without altering the frictional resistance and without necessitating a re-setting or re-adjustment thereof.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. A sustaining hinge assembly comprising a split eye bolt having a tapered external surface and providing a tubular hinge element, a pair of hinge pins adapted for

attachment to and support of a pair of movable members and further adapted for telescopic insertion into the opposite ends of said tubular hinge element for cooperative hinging movement with respect thereto, the ends of said hinge pins disposed within said tube having recessed interior portions providing an expansion chamber for the air within said tube, a non-metallic lining interposed between the cooperating portions of said hinge pins and said eye bolts, and a clamping member adapted to cooperatively engage the shank of said eye bolt and the tapered portion thereof to draw the split portions of the eye bolt together to obtain a desired frictional resistance between the hinge pins and the eye bolt.

2. The assembly set forth in claim 1 wherein the non-metallic bushing is made of plastic.

References Cited in the file of this patent

UNITED STATES PATENTS

2,260,403	Freston	Oct. 28, 1941
2,500,594	Young	Mar. 14, 1950
2,901,753	Sperzel	Sept. 1, 1959

FOREIGN PATENTS

917,032	Germany	Aug. 23 1954